

# The Maryland Fruit Grower

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## THE THIRTY NINTH ANNUAL MEETING

The Thirty Ninth Annual Meeting of the Maryland State Horticultural Society was held at Hotel Alexander, Hagerstown on January 5, 6, and 7, 1937. The attendance was excellent, considering the fine pruning weather that occurred during that time. Each speaker gave a fine discussion; the commercial exhibits were attractive, and the educational exhibits showing new apple varieties, spray injury studies, diseases and insects, pollination work, apple washing studies, and graphic charts of Maryland fruit growing, changes in tree population and market distribution, were well received, and studied by the growers in attendance.

President C. E. Bryan stated that the past year was good for those who were fortunate enough to have fruit, and cautioned growers not to relax their efforts for while the future may be bright any year may bring grief from over-production and market gluts. He stressed the need for more orderly marketing and suggested that the great increase of storage of fruit was causing too much fruit to be placed on the late market. He suggested getting more apples into consumption earlier in the season even at lower prices so as to get consumers apple-minded. He mentioned the present year as being unusual with apple prices steady in spite of a bumper citrus crop. He advised placing fewer apples on the market, selling only the good fruit and putting the poor fruit into by-products channels. He urged more investigation of fruit by-products; better standardized grades; effective advertising and made a plea for better cooperation with the fruit growers' organizations of the three surrounding states.

Dr. J. H. Weinberger, of the U. S. Horticultural Field Station, Beltsville, Maryland, stated that while growers thought of only nitrogen, phosphorus and potash in plant growth, there are eight other elements a shortage of which may cause growth troubles. Five of these may be supplied in spray materials; these being calcium, magnesium, sulfur, copper, and zinc; while three elements; iron, manganese and boron may be deficient and cause poor conditions of growth. Maryland soils do not seem to lack any of these elements but certain orchard soils in the country are deficient. The speaker described and illustrated the effects of a shortage of any of these elements upon young peach trees in his experiments and described how various shortages may be determined from the appearance of tree and leaf; also how these troubles may be corrected. The speaker gave a short report on some work in internal corking carried on in some orchards in West Virginia. It was found that injections of boric acid helped to correct corky breakdown in apples. Other treatments such as boric acid applied to soil; use of complete fertilizer (5-8-5), zinc sulfate applied to soil; magnesium sulfate applied to the soil; and manganese sulfate applied to the soil gave degree of control in the order named; injections

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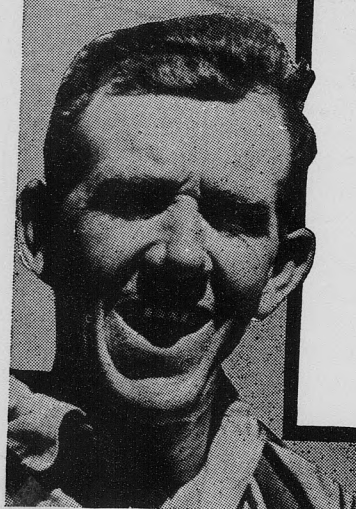
of boric acid being most effective. The speaker stated that some leaf scorch condition may appear in shallow orchard soils due to mineral deficiency.

Dr. D. F. Fisher of the U. S. Department of Agriculture, stated that washing is safe for fruit if growers realize that apples are living things. Careful and intelligent supervision of the washing is necessary. The safety of washing varies with variety and with season; Jonathan and York being subject to injury where heated washing solutions are necessary. He advised that where residue required heated washing solutions that such solutions were safer on storage apples than on newly picked fruit. He advised growers to keep complete records on washing so as to check back on injury, also to do experimental washing on small lots of various varieties before washing large quantities of fruit. The speaker also described York skin crack, which appeared the past year. This trouble develops late, just before harvest and usually occurs on weak trees with small crops or trees that have been affected by drought and stated that such fruit was more easily injured in washing.

Dr. Laurenz Greene, Head of the Horticultural Department of Purdue University, Indiana, discussed the June drop of fruit, stating that there are three drops of fruit; the first being weak or unpollinated blossoms, the second drop being a gradual shedding of weak small fruits; the third drop (June drop) being poorly pollinated fruits or excessive fruits. He discussed the factors involved in fruit set as depending upon tree vigor, weather conditions, moisture and food supply, stating that vigorous trees held their fruit better. He explained that young fruits must make active growth in early development. Cold, wet weather and low temperature during fruit bud formation or bloom cause blossom drop or hot dry weather during bloom may be serious. He explained the necessity of good growth and vigor both of which are dependent upon food supply, stating that 8 to 12 leaves per spur are essential in fruit set. He stated that burning of blossoms with spray material to decrease fruit set was not practical, with the possibility that disease may ruin the remaining crop. He also stated plump spurs could produce good-sized fruits with fewer seeds than fruit on weak spurs which required more seeds to get fruit size. His experimental work seemed to show that each seed formed in Grimes apples added  $\frac{1}{4}$  inch to the size of the apple. The importance of soil depth, soil drainage and soil management are important factors in fruit set, organic matter and fertilizer being essential. He stated that lime sulfur or Bordeaux sprays applied within 24 hours before or after pollination would tend to reduce the yield.

In the discussion of spray injury experiments Dr. A. B. Grove of the Winchester Field Station, Winchester, Virginia, stated that sulfur was dangerous in causing sulfur-scald if applied after the first cover or even after petal fall, and wettable sulfur was preferable in these sprays. A combination of lime sulfur and wettable sulfurs was found to be not always safe from burning or effective in scab control. He found that zinc sulfate prevented arsenical injury on peach but had found no sure arsenical burn control for apple. Various soaps, casein spreader and chemicals showed no greater benefit than lime to prevent arsenic injury. However, Bordeaux (1-2-100) was found to correct arsenical injury, especially where calcium arsenate was used. He found spray pressure not as important in causing injury as the amount of material applied.

Dr. H. W. Thurston of Pennsylvania State College, outlined the requirements of a good spray material as being cheap, easy to handle, and safe, stating that no material is entirely safe and effective. So we must expect certain



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materials to cause either injury, or give poor control. Extensive experiments in 1935-36 with several spray materials were reviewed to show differences due to time of application, material, seasons, etc. In his opinion, fixed spray schedules are impractical and we must vary our schedule and materials with locality and season, using several materials, if necessary, to get results.

Dr. F. J. Schneiderhan of West Virginia Experiment Farm, stated that better spray machines, new materials, and high pressures were complicating the spray question. In his work on the weather factor, he had found injury to vary with temperature, humidity, land topography, condition of fruit, and variety. His work indicated that rate of drying of the spray was important in spray injury, slow drying being dangerous, and that burning effects might appear over a month after the spray material was applied. He found difficulty in finding the cause of russet injury unless the spray schedule was known, as many injuries are very similar.

Dr. H. S. McConnell of the University of Maryland reported that the Maryland experiments in spray injury in 1936 were designed to determine the effects of materials commonly used by Maryland growers. Using Grimes, Stayman and Golden Delicious varieties, he found five types of spray injury developing during the season. Sulfur-scald developed in early July when temperatures were very high, and principally on the south and southwest sides of the trees. A grayish type of fine russet (scarf skin) was serious on Stayman, and seemed to be associated with number of sprays applied. Injuries to the stem cavities of Stayman and Grimes was caused by a combination of fixed nicotine and coposil sprays. Arsenical injury occurred on the calyx end of all Stayman fruit that received arsenical sprays, but not on the other varieties. The trees used in the experiments were of relatively low vigor, and had been poorly pruned for several years.

L. C. Carey of the U. S. Bureau of Agricultural Economics, Washington, D. C., noted a tendency toward smaller packages and mentioned open-mesh bags for apples and various types of paper cartons as being used in certain sections. Tight bulk packs of fruit in wooden containers have been overdone and the pressure pack in paper cartons has not proven satisfactory. The cell type of paper carton has been improved by use of hexagonal cells, which adjust themselves to various sized fruits. Baskets are not ideal for export use and the new northeastern box crate needs further trial before its export value is known. The speaker stated that pack was more important than package.

Dr. I. C. Haut, University of Maryland, described some work in excavating roots of apple trees and showed pictures of roots in various types of soil. In general roots grew best in good deep soils and were best developed in upper soil layers in sod orchards, being deeper where cultivation was done. The speaker stressed the importance of long roots with many branches and found differences in effect on yield from application of nitrate of soda at various distances from the tree, and suggested that nitrogen applications be applied uniformly under the tree, as well as beyond the spread of the branches.

H. E. Klingaman, Agronomist of the U. S. Soil Conservation Service, advised the selection of a cover crop best adapted to particular orchard soils. He outlined the benefits of cover crops as conserving soil moisture and also drying out the soils in spring when soils were water-logged. He stated that contours and terraces assisted in increasing soil water supply and quoted figures to show water penetration in terraced land. He stated that cover crops took up excess nitrogen and stored it. He advised liming for good cover crop growth, due to its effect upon unavailable soil elements and the use of

phosphorus in sod orchards and occasionally cutting the sod to avoid sod-bound conditions. The speaker advised that orchard soil be tested before any cover crop program is begun.

Dr. W. S. Hough of Winchester Research Laboratory was prevented from attending, due to illness, but in his paper, he states that growers must control the early brood of codling moth, and also that there is no substitute for lead arsenate where codling moth is serious. For increasing the efficiency of lead arsenate, he has used combinations of lead arsenate, and oil emulsion, and also has added Bordeaux to this combination of lead and oil, applying this spray in two covers in June. He also reports the use of potash fish-oil soap with lead arsenate in sprays containing either lime or Bordeaux. Most effective of his tested materials was a nicotine, oil and lead arsenate combination which seemed to control moths, eggs, and larvae of codling moth. The residue factor enters into the use of such sprays.

Dr. A. L. Schrader, Head of the University of Maryland Horticultural Department, discussed apple pruning experiments in Maryland for the past 15 years, showing by use of lantern slides, the actual results of detail pruning on individual trees, over a period of years. Detail pruning consists largely of the removal of weakly growing branches (or "thin wood") most of which are small branches usually found on the inner and lower parts of the tree. Occasionally, larger branches fall into this class, especially on the lower parts of the tree. He stated that the weak wood often hangs down on the lower side of main branches, and is most easily recognized during fruiting season, if one stands under the tree. Such growth bears small, poorly-colored apples. After the "weak" wood is removed, further detail pruning by small cuts may be necessary to open the tree for better light conditions, and better spraying. Large branches are not removed to open the tree, as undesirable holes are produced and fruiting surface of the tree is reduced.

In discussing culture and handling of raspberries and blackberries, Dr. J. H. Clark of Rutgers University, advised growers to make use of fertile, well-drained land. Of red raspberry varieties for New Jersey, Latham is still

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recommended and the most important variety. Ranere (St. Regis) on light sandy land or for home use. Chief is early but not widely adaptable. The Viking yields well, but is disease-susceptible. Newburgh is of uncertain value, as it winter-injures in mild winters. Taylor is very productive and may become a standard variety. Marcy is a new variety, most vigorous and produces fine fruit, large and of good quality. Of the black raspberries, Cumberland and Plum Farmer are hard to find in disease-free stock. Quillen is resistant to anthracnose. Bristol may have promise due to disease resistance. Naples and Dundee are not as good as Bristol in New Jersey. Varieties of blackberries are badly mixed. Blowers is better than Erie, Merserau or Eldorado. Alfred is not outstanding in New Jersey, Russell is adapted to light dry soils, and Black Diamond freezes out. Dr. Clark urged use of disease-free plants, and improved soil by increase of organic matter content. The latter being difficult, the use of mulching material was recommended, as it doubled yield and raised soil moisture content 50% in New Jersey trials. Mulch keeps soil cool. It should be placed on the soil deeply enough to keep sun out, and keep weeds down. A little renewal mulch is necessary yearly, and shoots between the rows should be hoed or broken off. Mulching must be continued, if started, due to shallow rooting. Fire hazard is lessened by fire furrows. The first year of mulching, about 200 lbs. of nitrate of sod per acre will be necessary to keep up the nitrogen supply lost by rotting of the mulch. The speaker also discussed facing of the packed fruit, and the use of cellophane wrapped baskets for special markets.

Dr. J. H. Gourley, Chairman of Ohio State University, Department of Horticulture described the chemistry of color of fruits particularly in the use of sugars that the plants manufacture in the leaves. Carbon dioxide from the air, combined with water taken by the tree from the soil, is converted into sugars by the green coloring matter of the leaves, through energy supplied by the sun. He stated that color was dependent upon sunlight, proper but not excessive use of nitrogen fertilizer, proper pruning and thinning of fruit to make use of food reserves of the tree. There seems to be no advantage of complete fertilizer over nitrogen alone, on color, but the speaker advised growers to keep an open mind in this matter.

Poor cold, or dry soils, or bad sites are no help to color. New red bud sports should be planted if growers are sure that they are adaptable and good. Growers would learn much, the speaker stated, if they would sit under a tree, look up into it, and observe what it needs to produce good crops of high color.

Carroll R. Miller, Secretary-Manager of Appalachian Apples, Inc., reported that in the six months of the organization, there were 540 members, 49 from Maryland, with a total pledged subscription of over 5 million bushels of apples of U. S. Utility and above, at  $\frac{1}{2}$  cent a bushel, or over 50% of the tonnage of the crop in the four states of Virginia, Pennsylvania, West Virginia, and Maryland. The label is well-received, and no packages bearing the label reported out of grade. Over 470,000 pieces of advertising, and over 2½ million basket labels have been distributed. 6,900 stores out of 33,000 stores in the territory have been reached. There are 9 types of advertising material being used. One man is engaged in direct grocery store service to better display of apples. Louisville, Cincinnati, Baltimore and Charleston, W. Va., are being used as test cities. Newspapers have taken the material well, and over 3 million copies with apple publicity, have been distributed. The organization has been active in various apple shows, food fairs, apple week, cooking schools, and has canvassed over 1,100 apple buyers. All bills are paid,

but there is more work to be done, so that more money is needed. It seems certain that the publicity has had some effect on price and demand for apples.

M. A. Blake, Head of Rutgers University Horticultural Department described methods of making Delicious apple trees bear profitable crops. He stated that this variety is late in coming into bearing, and described a planting method where trees are set 40 by 40 feet square, with a tree in the center of four trees, giving 54 trees per acre. He stressed the fact that good, large, thick, leathery leaves were essential. Growers should look at their trees, and observe how they respond to various treatments. Growth status was explained as keeping the tree growing enough to build reserves. The New Jersey classification of growth status uses leaves as a measure of the tree's vigor, and growth condition. Long, moderately wide leaves are best. Dark colored bark, plump spurs and buds, rather thick twigs, good proportion of spurs to twigs and several good leaves per spur were considered essential. The speaker advised proper liming of orchard soils; ample pollination, lighter pruning of over-vegetative, fast growing trees, also use of cover crops and reducing fertilization if trees were growing too rapidly and not fruiting sufficiently. The main thing is to keep the Delicious tree growing steadily, but not too vigorously.

Dr. Gourley of Ohio State University, in discussing the profitable use of mulch in the orchard, felt that the grower should consider whether mulch conserves soil; whether total increased yield is sufficient for profit; whether it encourages yield at expense of quality. He gave figures showing the soil-conserving and moisture-penetrating effects with mulch, stating that a 2½ inch rainfall near Zanesville, Ohio had penetrated soil as follows: bare soil 1½-2 inches; timber land 8 inches; meadow 4-5 inches; blue grass sod 8 inches. He had found that mulching had caused better organic matter content than sod, and also delayed frost penetration. Close investigation showed that mulching did not delay time of blossoming when compared to any other soil treatment. The average yield of about 23 varieties of mulched apple trees at Ohio Station for 26 years was 15.5 bushels per tree, or about 620 bushels per acre, but favorable soil was a factor, beside mulching. It was also found that deep roots under mulch were evidently as well distributed as under unmulched trees. Twig diameter of mulched Stayman and Delicious was better, and though the yield of cover-cropped trees was a slightly better, the mulched trees looked better. There seemed to be little difference in size of 20 year old Stayman and Delicious trees in the mulched and unmulched plots, and the grade of fruit on 11 year average was about the same. Growing costs per bushel were about 1½ cents less on the mulched trees, the color of the fruit on mulched trees being slightly poorer in color, probably due to heavy leaf growth, and the mulched trees produced fruit of better average size, especially on the Stayman. The speaker suggested that growers produce their own mulch material, by use of lime and complete fertilizer applied broadcast. About 200 pounds of mulch is required per ton, costing about 60 to 65 cents per tree, calculated on the basis of \$8.00 per ton. Renewal of mulch is required every two years, but growers should buy material when price is low, and apply at any time possible.

Dr. G. L. Zundel of Pennsylvania State College told berry growers that crown gall was the worst disease trouble of cane fruits, as it was hard to detect before planting. He discussed various diseases and control, and advised that black raspberries and blackberries, or red raspberries and black raspberries not be planted closer than 1,000 feet from each other, due to disease spread. Use of the best, disease-free stock, roguing out and

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destroying diseased plants, and use of 1 to 9 concentrated lime-sulfur spray in dormant season, and three applications of 1 to 40 lime-sulfur spray during the growing season, for anthracnose control were among the recommendations made by the speaker.

### *THE WEST VIRGINIA MEETINGS*

The Forty Fourth Annual Convention of the West Virginia Horticultural Society has been announced for Martinsburg, February 10 and 11. The program looks good. There will be discussions of orchard soils; relations between growers and distributors; how our apples look in southern markets; spraying suggestions; codling moth control; looking ahead ten years in fruit growing; practical irrigation; soils programs; apple advertising and other interesting discussions that always put lots of pep into the program down there. Plan to attend. Good exhibits are also a feature. We owe those growers a return visit, for they surely are loyal visitors to our meetings. Go to Martinsburg February 10th and 11th. The speakers and topics are interesting and instructive.

### *SCURFY SCALE*

Scurfy scale is a small white scale usually found on the lower parts of apple trees. Generally, it is not harmful, but if it multiplies, it can do real damage. The scale is rather difficult to control, as under the scales, the small scale insects may be found packed in, and piled up on each other, so that a real spray dosage is necessary to creep under the scale and kill the insects. Dr. Cory, State Entomologist, recommends the use of a 5% miscible oil spray applied during dormant season. It may be that this spray will have to be repeated next year, if control is not complete. Examine your apple trees, and use oil spray if amount of scale seems to warrant it.

### *THINNING*

Thinning, like pruning, is still a topic of great argument. Some growers thin to reduce tree breakage. Other growers thin for size; others thin to remove the defective fruit, and some growers do not thin, as they want small fruit for export. There is no question as to the virtues of thinning. The grower is the one to decide just what type of thinning is to be used in his particular case. In a paper given before the Wisconsin State Horticultural Society, C. W. Ellenwood, of Ohio, reported the results of thinning as affected by variety. (Ohio Agr. Exp. Sta. Bul. 508.) He found that thinning reduced the total crop weight of Jonathan much more than of Grimes. There was more size increase and more gain in returns per bushel in thinning Grimes, than in thinning Jonathan. Ten inch thinning of Grimes gave results comparable to 8 inch thinning of Jonathan. There was also some difference in time of thinning, according to variety. Need for thinning varied with variety, in relation to extent of June drop. Delicious and Stayman, with heavy June drop might not need the same treatment as Grimes, Wealthy, Baldwin, Rome, and Banana. It was stated that pruning and thinning have some effects that are hidden, when both treatments are used together. Some varieties are more affected by pruning, and with proper pruning, the need for thinning these may be eliminated. However, there are some varieties where clusters of fruit have to be broken up, even after careful pruning. Some Maryland growers have found that proper pruning has reduced the extent of their thinning operations. This is especially true in peach pruning.

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